

We claim:

1. A stacking apparatus for assembly of electrochemical cells comprising:

5 -a supporting structure;

 -at least one stacking head having an adjustable holding member adapted to hold an electrochemical laminate of a pre-determined length and having means for adjusting the shape of said electrochemical laminate;

10 -said at least one stacking head being operative to stack a plurality of said electrochemical laminates of the pre-determined length one on top of the other, during stacking said adjustable holding member holding each particular electrochemical laminate of the pre-determined length in a shape such that a central portion of the particular electrochemical
15 laminate of the pre-determined length is deposited first followed by a motion of said adjustable holding member that progressively lowers the remainder of the particular electrochemical laminate of the pre-determined length, thereby preventing air entrapment between adjacent electrochemical laminates of the pre-determined length in the stack.

20 2. A stacking apparatus as defined in claim 1, wherein said adjustable holding member includes a vacuum system generating a negative pressure that holds said pre-determined length of electrochemical laminate.

25 3. A stacking apparatus as defined in claim 2, wherein said adjustable holding member includes a plate made of a micro-porous material through which the vacuum system generates said negative pressure.

30 4. A stacking apparatus as defined in claim 3, wherein said adjustable holding member includes a vacuum chamber positioned adjacent said plate of micro-porous material.

5. A stacking apparatus as defined in claim 1, further comprising mechanical cutting means adjacent said stacking head and adapted to cut a continuous length of electrochemical laminate to said pre-determined length.
- 5 6. A stacking apparatus as defined in claim 5, wherein said mechanical cutting means includes a rotary knife.
7. A stacking apparatus as defined in claim 1, wherein said at least one stacking head includes two adjustable holding members rotatably mounted onto said at
10 least one stacking head.
8. A stacking apparatus as defined in claim 7, wherein said two adjustable holding members are rotatably mounted through a slot system guiding the rotational movement of said two adjustable holding members, thereby
15 preventing damage to said electrochemical laminate of the pre-determined length.
9. A stacking apparatus as defined in claim 1, wherein said at least one stacking head is movable vertically and horizontally within said supporting structure.
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10. A stacking apparatus as defined in claim 1, comprising a plurality of stacking heads mounted side by side on said supporting structure such that a plurality of electrochemical cells may be assembled simultaneously.
- 25 11. A stacking apparatus as defined in claim 1, further comprising a treated surface onto which a plurality of said electrochemical laminates of the pre-determined length are stacked.
- 30 12. A stacking apparatus as defined in claim 1, further comprising at least one carriage platform having a treated surface onto which a plurality of said electrochemical laminates of the pre-determined length are stacked.

13. A process for assembling a plurality of electrochemical laminates to form a battery comprising the steps of :

-laminating a continuous length of anode film with a continuous length of pre-assembled half cell comprising a current collector, a cathode film and an electrolyte separator film;

-cutting the laminate into pre-determined lengths of laminates;

-stacking said pre-determined lengths of laminates one on top of the other in a shape such that a central portion of each said pre-determined length of laminate is deposited first, followed by a motion that progressively lowers the remainder of said pre-determined length of laminate, thereby preventing air entrapment between adjacent pre-determined lengths of laminate in the stack.

14. A process for assembling a plurality of electrochemical laminates to form a battery wherein said electrochemical laminates are in a charged state when being assembled one above the other.